Stanley Smith & Co Plastics Ltd

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Vitrapad

CUTTING BOARDS FOR ALL INDUSTRIES

Stanley Smith & Co specialise in the production of cutting boards for all trades.

	POWER PRESS	ROLLER PRESS	CLICKING PRESS	HYTRONIC PRESS	FOOD PREPARATION	RESTAURANT & CATERING	ABATTOIR
VITRALENE pressed polypropylene	✓		✓				
VITRALENE E extruded polypropylene		✓					
Conductive polypropylene				✓			
VITRONE E extruded rigid pvc		✓					
VITRONE KFCB semi-rigid pvc	✓		✓				
VITRATHENE HMW high Molecular weight polythene – pure white natural					✓	✓	✓
VITRATHENE HMW-full colour range					✓	✓	✓

Size range: 1000 × 1000 mm
2000 × 1000 mm
2440 × 1220 mm
3000 × 1220 mm
3050 × 1220 mm
3000 × 1500 mm
3050 × 1525 mm
6000 × 1500 mm

Thickness range extruded sheet 1.5 to 12.00 mm
Thickness range pressed sheet 3.0 to 75.00 mm

Cut to size panels available for minimum 50 sheets o/s

Edge finishing and moulding to customer drawings

All Vitrapad cutting boards (except KFCB) are non-toxic and suitable for direct contact with foodstuffs

Resins and compounds (Cont'd)

Polyphthalamide (PPA)

Materials	Properties		ASTM test method	Unreinforced	Extra-tough	33% glass reinforced	45% glass reinforced	33% glass reinforced V-0	40% mineral reinforced
Processing	1a. Melt flow (mg./10 min.)		D1238						
	1. Melting temperature, °C.	T_m (crystalline)	D-3418	310	310	310	310	310	310
		T_g (amorphous)							
	2. Processing temperature range, °F. (C = compression; T = transfer; I = injection; E = extrusion)			I: 610-660	I: 610-660	I: 610-660	I: 610-660	I: 610-660	I: 610-660
	3. Molding pressure range, 10^3 p.s.i.			5-15	5-15	5-15	5-15	5-15	5-15
	4. Compression ratio			2.5-3	2.5-3	2.5-3	2.5-3	2.5-3	2.5-3
	5. Mold (linear) shrinkage, in./in.		D955	0.015-0.020	0.015-0.020	0.002-0.006	0.002-0.003	0.002-0.004	0.000
Mechanical	6. Tensile strength at break, p.s.i.		D638[b]			32,000	38,000	26,000	17,000
	7. Elongation at break, %				13.0	6.0	5.2		
	8. Tensile yield strength, p.s.i.		D638[b]	15,100	10,800				26,000
	9. Compressive strength (rupture or yield), p.s.i.		D695			40,000	45,500		
	10. Flexural strength (rupture or yield), p.s.i.		D790	23,000	15,000	45,000	54,000	37,300	30,000
	11. Tensile modulus, 10^3 p.s.i.								
	12. Compressive modulus, 10^3 p.s.i.								
	13. Flexural modulus, 10^3 p.s.i.	73° F.	D790	475	300	1,750	2,250	1,900	1,300
		200° F.	D790			483	603		
		250° F.	D790			429	472		
		300° F.	D790						
	14. Izod impact, ft.-lb./in. of notch (⅛-in. thick specimen)		D256A	1.0	20	2.4	2.5	1.5	0.8
	15. Hardness	Rockwell	D785	125	120	125	125	125	125
		Shore/Barcol	D2240/ D2583						
Thermal	16. Coef. of linear thermal expansion, 10^{-5} in./in./°C.		D696		33.0	13	8		19
	17. Deflection temperature under flexural load, °F.	264 p.s.i.	D648	248	248	545	549	523	361
		66 p.s.i.	D648						
	18. Thermal conductivity, 10^{-4} cal.-cm./sec.-cm.^{2}-°C.		C177	1.7		2.3	2.6		2.6
Physical	19. Specific gravity		D792	1.17	1.13	1.43	1.56	1.71	1.54
	20. Water absorption (⅛-in. thick specimen), %	24 hr.	D570	0.81	0.65	0.21	0.12	0.18	0.14
		Saturation	D570						
	21. Dielectric strength (⅛-in. thick specimen), short time, v./mil		D149			530	560	458	>560
		SUPPLIERS[a]		Amoco Performance Products	Amoco Performance Products	Amoco Performance Products	Amoco Performance Products	Amoco Performance Products	Amoco Performance Products

a—See the Buyers' Guide, p. 581, for additional suppliers of specialty materials and custom compounds.
b—Tensile test method varies with material: D638 is standard for thermoplastics; D651 for rigid thermosetting plastics; D412 for elastomeric plastics; D882 for thin plastics sheeting.
c—Dry, as molded (approximately 0.2% moisture content).
d—As conditioned to equilibrium with 50% relative humidity.
e—Test method in ASTM D4092.
f—*Pseudo* indicates that the thermosetting and thermoplastic components were mixed in the form of pellets or powder prior to fabrication.
g—Dow Plastics samples are unannealed.

Polypropylene

Homopolymer

	Unfilled	10-40% talc-filled	10-40% calcium carbonate-filled	10-30% glass fiber-reinforced	40% glass fiber-reinforced	20-30% long glass fiber-reinforced	40% long glass fiber-reinforced	30% random glass mat	40% random glass mat
1a.	0.4-38.0	0.1-30.0	0.1-30.0	1-20	1-20				
1.	160-175	158-166	166	166	166	166	163	166	166
	-20								
2.	I: 375-550 E: 400-500	I: 350-550	I: 375-525	I: 425-475	I: 450-550	I: 360-440	I: 370-410	C: 420-440	C: 420-440
3.	10-20	10-20	8-20		10-25		8-12	1-2	1-2
4.	2.0-2.4						3-4		
5.	0.010-0.025	0.008-0.015	0.007-0.014	0.002-0.005	0.003-0.005	0.0025-0.004	0.001-0.003	0.002-0.003	0.001
6.	4500-6000	3545-5000	3400-4500	6500-13,000	8400-15,000	7500-10,100	10,500	12,000	14,000
7.	100-600	3-8	10-60	1.8-3.0	1.5-4	2.1-2.2	1.7	3	2.1
8.	4500-5400	3500-5000	3850-4600					12,000	14,000
9.	6500-8000	7500	3000-7200	6500-8400	8900-9800	6600-7200	10,400		9000
10.	6000-8000	7000-8200	5500-7000	7000-20,000	10,500-22,000	10,000-10,500	20,800	20,000	24,000
11.	165-225	450-575	375-500	700-1000	1100-1500	750-900	970	670	850
12.	150-300								
13.	170-250	210-525	230-450	310-780	950-1000	550-800	1000	620	800
	50	400	320						
	35								
14.	0.4-1.4	0.4-1.4	0.6-1.0	1.0-2.2	1.4-2.0	3.5-7.8	10.04	12.2	14
15.	R80-102	R83-110	R78-99	R100-115	R102-111	R105-117			
16.	81-100	42-60	28-50	21-62	27-32			15	15
17.	120-140	132-180	135-170	253-288	300-330	250-295	300	310	310
	225-250	210-290	200-270	290-320	330	305			
18.	2.8	7.6	6.9	5.5-6.2	5.4-6.8	2.35			
19.	0.900-0.910	0.97-1.27	0.97-1.25	0.97-1.14	1.22-1.23	1.04-1.17	1.21	1.1	1.19
20.	0.01-0.03	0.01-0.03	0.02-0.05	0.01-0.05	0.05-0.06	0.05			
			0.1		0.09-0.10				
21.	600	500	410-500		500-510				360
	Amoco Chemicals; Aristech Chem.; Bamberger Polymers; Eastman; Exxon; Ferro Corp.; Fina; Himont USA—Adv. Mat'l.; M.A. Polymers; Monmouth; Phillips; Quantum, USI; Rexene; Schulman; Shell; Shuman; Solvay Polymers; Thermofil; Wash. Penn	Akzo; Bamberger Polymers; Eastman; Exxon; Ferro Corp.; Himont USA—Adv. Mat'l.; M.A. Polymers; MRC; Polifil; Polycom Huntsman; RTP; Rexene; Schulman; Thermofil; Wash. Penn	Akzo; Bamberger Polymers; Eastman; Ferro Corp.; Himont USA—Adv. Mat'l.; M.A. Polymers; Polifil; Polycom Huntsman; RTP; Rexene; Schulman; Thermofil; Wash. Penn	Akzo; Bamberger Polymers; Eastman; Ferro Corp.; Himont USA—Adv. Mat'l.; ICI Advanced Materials; M.A. Polymers; MRC; Polifil; RTP; Schulman	Adell; Akzo; Ferro Corp.; Himont USA—Adv. Mat'l.; ICI Advanced Materials; M.A. Polymers; MRC; Polifil; RTP; Schulman; Thermofil; Wash. Penn	Akzo; Hoechst Celanese; ICI Advanced Materials	Hoechst Celanese; ICI Advanced Materials	Azdel	Azdel

Polypropylene (Cont'd)

Materials	Properties	ASTM test method	Homopolymer (cont'd): 42% directionalized glass mat, Parallel	Homopolymer (cont'd): 42% directionalized glass mat, Transverse	Homopolymer (cont'd): Impact modified 40% mica-filled	Homopolymer (cont'd): EMI shielding (conductive); 30% PAN carbon fiber	Copolymer: Unfilled	Copolymer: Unfilled, impact-modified
Processing	1a. Melt flow (mg/10 min.)	D1238					0.8-44.0	
	1. Melting temperature, °C. T_m (crystalline)		168	168	168	168	160-175	160-168
	T_g (amorphous)						−20	−20
	2. Processing temperature range, °F. (C = compression; T = transfer; I = injection; E = extrusion)		C: 420-440	C: 420-440	I: 350-470	I: 360-470	I: 375-550 E: 400-500	I: 390-500 E: 400-500
	3. Molding pressure range, 10^3 p.s.i.		1-2	1-2			10-20	10-20
	4. Compression ratio						2-2.4	2-2.4
	5. Mold (linear) shrinkage, in./in.	D955	0.0005-0.0015	0.0025-0.0035	0.007-0.008	0.001-0.003	0.010-0.025	0.010-0.025
Mechanical	6. Tensile strength at break, p.s.i.	D638[b]	32,200	10,000	4500	6800	4000-6500	3500-5000
	7. Elongation at break, %	D638[b]	2.1	2.4	4	0.5	200-500	200-700
	8. Tensile yield strength, p.s.i.	D638[b]	32,200	10,000			3000-4300	1600-4000
	9. Compressive strength (rupture or yield), p.s.i.	D695					3500-8000	3500-6000
	10. Flexural strength (rupture or yield), p.s.i.	D790	43,180	22,785	7000	9000	6000-7000	4000-6000
	11. Tensile modulus, 10^3 p.s.i.	D638[b]	1400	705	700	1750	130-180	50-150
	12. Compressive modulus, 10^3 p.s.i.	D695						
	13. Flexural modulus, 10^3 p.s.i. 73° F.	D790	1375	740	800	1550	130-200	60-160
	200° F.	D790					40	
	250° F.	D790					30	
	300° F.	D790						
	14. Izod impact, ft.-lb./in. of notch (¼-in. thick specimen)	D256A			0.7	1.1	1.1-14.0	2.2-No break
	15. Hardness Rockwell	D785					R55-96	R50-80
	Shore/Barcol	D2240/ D2583					Shore D70-73	Shore D45-55
Thermal	16. Coef. of linear thermal expansion, 10^{-5} in./in./°C.	D696	14	22			68-95	68-86
	17. Deflection temperature under flexural load, °F. 264 p.s.i.	D648	310	310	205	245	130-140	115-135
	66 p.s.i.	D648					165-220	167-182
	18. Thermal conductivity, 10^{-4} cal.-cm./sec.-cm.^{2}-°C.	C177					3.5-4.0	3.5-4.0
Physical	19. Specific gravity	D792	1.21	1.21	1.23	1.04	0.890-0.905	0.880-0.905
	20. Water absorption (¼-in. thick specimen), % 24 hr.	D570				0.12	0.03	0.03
	Saturation	D570						
	21. Dielectric strength (¼-in. thick specimen), short time, v./mil	D149					600	500
	SUPPLIERS[a]		Azdel	Azdel	Akzo: Ferro Corp.; M.A. Polymers; Polifil; Schulman	Akzo; ICI Advanced Materials; RTP	Aristech Chem.; Bamberger Polymers; Eastman; Exxon; Ferro Corp.; Fina; Himont USA—Adv. Mat'l.; M.A. Polymers; Monmouth; Phillips; Quantum, USI; Rexene; Schulman; Shell; Shuman; Solvay Polymers; Wash. Penn	Exxon; Himont USA—Adv. Mat'l.; Huntsman Monmouth; M.A. Polymers; Phillips; Quantum, USI; Rexene; Schulman; Solvay Polymers; Wash. Penn

Polypropylene (Cont'd)

	Copolymer (Cont'd): 10-20% glass fiber-reinforced	20-40% glass fiber-reinforced	10-40% talc-filled	10-40% calcium carbonate-filled	Polyallomer
1a.	0.1-20	0.1-20	0.1-30	0.1-30	
1.	160-168	160-168			120-135
2.	I: 350-480	I: 350-480	I: 350-470 E: 425-475	I: 350-470	I: 430-445
3.			15-20	15-20	1-2
4.			2-2.5	2-2.5	
5.	0.003-0.01	0.001-0.01	0.009-0.014	0.006-0.014	0.010-0.020
6.	5000-8000	6000-10,000	3000-3775	2500-3465	3000-3800
7.	3.0-4.0	2.2-3.0	20	40-50	400-600
8.			3100-3800	2700-3800	3000-3400
9.	5500-6500	5400-6700			
10.	7000-11,000	9000-15,000	4500-5100	4000-6500	
11.				3500	
12.					
13.	355-510	600-960	210-400	200-370	70-110
14.	0.95-2.7	0.9-3.0	0.6-4.0	0.7-2.0	1.7-3.8
15.	R100-103	R104-105	R83-88	R81-89	R50-65
		Shore D45-55			
16.					83-100
17.	280-290	280	132-165	116-155	124-133
	305	310	210-250	170-235	165-182
18.					2-4
19.	0.99-1.04	1.11-1.21	0.97-1.24	0.97-1.24	0.896-0.899
20.	0.01	0.01	0.02	0.02	<0.01
21.					800
	Akzo: Ferro Corp.; Himont USA—Adv. Mat'l.; ICI Advanced Materials; M.A. Polymers; Polifil; RTP; Schulman	Akzo: Ferro Corp.; Himont USA—Adv. Mat'l.; ICI Advanced Materials; M.A. Polymers; Polifil; RTP; Schulman	Akzo: Eastman; Ferro Corp.; Himont USA—Adv. Mat'l.; M.A. Polymers; Polifil; Polycom Huntsman; Quantum, USI; RTP; Rexene; Schulman	Akzo; Eastman; Ferro Corp.; Himont USA—Adv. Mat'l.; M.A. Polymers; Polycom Huntsman; Polifil; RTP; Rexene; Schulman; Wash. Penn	Eastman; Rexene

Polystyrene and styrene copolymers (see also TPE)

	Polystyrene homopolymers: High and medium flow	Heat-resistant	30% long and short glass fiber-reinforced	20% long and short glass fiber-reinforced
1a.				
1.				
	74-105	100-110	110-120	115
2.	C: 300-400 I: 350-500 E: 350-500	C: 300-400 I: 350-500 E: 350-500	I: 400-480	I: 400-550
3.	5-20	5-20		[redacted]
4.	3	3-6		
5.	0.004-0.007	0.004-0.007	0.001-0.002	0.001-0.003
6.	5200-7500	6440-8200	11,000-13,000	10,000-12,000
7.	1.2-2.5	2.0-3.8	1-1.2	1.0-1.3
8.		6440-8150		
9.	12,000-13,000	13,000-14,000	16,500-17,500	16,000-17,000
10.	10,000-14,500	13,000-14,000	14,000-20,000	14,000-18,000
11.	330-475	450-485	1200-1300	900-1200
12.	480-490	495-500		
13.	380-490	450-500	1200	850-1100
14.	0.35-0.45	0.4-0.45	0.9-3.0	0.9-2.5
15.	M60-75	M75-84	M85-95	M80-95, R119
16.	50-83	68-85	20	39.6-40
17.	169-202	194-217	215-220	200-220
	155-204	200-224	225-230	220-230
18.	3.0	3.0		[redacted]
19.	1.04-1.05	1.04-1.05	1.29	1.20
20.	0.01-0.03	0.01	0.09	0.07-0.01
	0.01-0.03	0.01		0.3
21.	500-575	500-525	450	425
	A & E Plastics; Amoco Chemicals; Bamberger Polymers; Chevron; Dow Plastics; Fina; Hammond; Huntsman; Mobil; Monsanto; Schulman; USS Chem.	A & E Plastics; Amoco Chemicals; Chevron; Dow Plastics; Fina; Hammond; Huntsman; Ivex; Mobil; Monsanto; USS Chem.	Akzo; M.A. Polymers; RTP	Akzo; Ferro Corp.; Ferro Eng. Therm.; ICI Advanced Materials; M.A. Polymers; Mobil; RTP; Thermold

a—See the Buyers' Guide, p. 681, for additional suppliers of specialty materials and custom compounds.
b—Tensile test method varies with material: D638 is standard for thermoplastics; D651 for rigid thermosetting plastics; D412 for elastomeric plastics; D882 for thin plastics sheeting.
c—Dry, as molded (approximately 0.2% moisture content).
d—As conditioned to equilibrium with 50% relative humidity.
e—Test method in ASTM D4092.
f—Pseudo indicates that the thermosetting and thermoplastic components were mixed in the form of pellets or powder prior to fabrication.
g—Dow Plastics samples are unannealed.

	Poly-propylene			Poly-propylene			Poly-propylene			Poly-propylene			Poly-propylene			Poly-propylene			Poly-propylene		
	Hercules			Hercules			Hercules			Hercules			Hercules			Hercules			Hercules		
	Pro-Fax 7523			Pro-Fax 7523N			Pro-Fax 7623			Pro-Fax 7724			Pro-Fax 7823			Pro-Fax 7824			Pro-Fax 8523		
	Copolymer.general purpose low temperature impact resist.			Copolymer High impact strength high temperatures, chemical resistant			Copolymer Medium impact strength,FDA approved for food			Copolymer Heat and extraction resistant			Copolymer Maximum melt Strength,low temperature impact str.			Copolymer Heat and extraction resistant			High impact resistance		
										Profiles, pipes						Profiles, pipes					
1	Injection/Extrusion			Injection			Injection			Extrusion			Extrusion			Extrusion			Injection/Extrusion		
2	<550	<288																	<350	<177	
3	<550	<288																	<550	<288	
4	<550	<288																	<550	<288	
5	2.1-2.4												430	221						2.1-2.4	
6	0.010-0.012																			0.010-0.013	
7	3.6-5.0			4.0[a]			2.0[a]			0.8			0.4[a]			0.4				2.8-4.0	
8																					
9	56.13	0.898	0.898	56.88	0.910	0.910	56.25	0.900	0.900	56.19	0.899	0.899	56.25	0.900	0.900	56.19	0.899	0.899	56.25	0.900	0.900
10	30.90	1.11	1.11																30.85	1.11	1.11
11	>4.00	>2.81	>27.6	4.80	3.37	33.1	4.10	2.88	28.3	4.20	2.95	29.0	3.90	2.74	26.9	4.10	2.88	28.3	>2.90	>2.04	>20.0
12																					
13	7.00[b]	4.92	48.3																6.00	4.22	41.4
14	1.50[a]	1.05	10.3																1.20	0.84	8.3
15		9.5-11																		5.5-7.5	
16					8.6			9.5			10.5			11			11				
17	1.70	1.20	1.17																		
18	7.00	4.92	48.3																		
19	2.23	1.57	1.54	2.40	1.69	1.66	2.10	1.48	1.45	2.50	1.76	1.72	2.00	1.41	1.38	2.00	1.41	1.38	1.20	0.84	0.83
20	>1.30	>0.91	>0.90	1.70	1.20	1.17													5.00	3.52	34.5
21																			1.64	1.15	1.13
22	2.10	11.42	0.11	1.00	5.44	0.05	3.50	19.04	0.19	5.80	31.55	0.31	8.00	43.52	0.43	8.00	43.52	0.43	1.02	0.72	0.70
23				0.30[b]	1.63	0.02	0.70[b]	3.81	0.04	0.80	4.35	0.04	1.00[b]	5.44	0.05	1.00	5.44	0.05			
24	R88 (Rockwell)						R86 (Rockwell)			R86 (Rockwell)			R80 (Rockwell)			R83 (Rockwell)			>1.50	>8.16	>0.08
25	1.22	4.20	0.18																R61-69 (Rockwell)		
26	0.50	0.50	2.09																1.22	4.20	0.18
27	5.44	9.80	9.80																0.50	0.50	2.09
28	290	143																	5.44	9.80	9.80
29																					
30	>190	>88																	275	135	
31	>120	>49																			
32	>187	>86		234	112		126	52		126	52		126	52		126	52		>190	>88	
33		105/1.50					190	88		190	88		187	86		187	86		>111	>44	
34		>1.0X10[16]																	>160	>71	
35																					
36																				>1.0X10[15]	
37	525	20.7	20.7																		
38		2.3																			
39		2.3																	650	25.6	25.6
40		2.3																		2.3	
41		0.0003																		2.3	
42		0.0003																		2.25	
43		0.0003																		0.0003	
44																				0.0003	
45	Transluc/opaque																			0.0003	
46		0.01-0.03																		Opaque	
47																					
48																				0.01-0.03	
49																					
50	None																				
51	Attacked slowly																			None	
52	None																			Attacked slowly	
53	Very resistant																			None	
54	Flam																			Very resistant	

[a]175 Fan, 79 C
[b]-30 Fan, -34 C

[c]Cond. I
[d]0 Fan, -18 C

[c]Cond. I
[d]0 Fan, -18 C

[c]Cond. I
[d]0 Fan, -18 C

Metric Values in Blue